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ABSTRACT

Television is widely used in Ontario (Canada) public schools and is appreciated for making teaching more effective. Yet studies on the effectiveness of television as a learning tool outside of the classroom are ambivalent: many have claimed television to have a negative effect on learning, while others show neutral or moderately positive effects. Much of the uncertainty may have to do with the complexity of decoding information from television--which is a more challenging process, requiring more background information--than many people think. There is evidence that decoding can be controlled in the classroom. In television-based systems, the teacher has control over the method of presentation and is able to incorporate the programs and print material. These systems are effective as teaching aids, not as a replacement to teaching. Furthermore, they cannot just be "turned on," but require preparation by the teacher, and incorporation into on-going classroom lessons. There must be a close "fit" between the television component, the school curriculum, and the student. Despite widespread use, there are some limitations in accessing the programs and print material, and in teacher training. But when properly employed, television can be effective as a motivator for students; as an introduction to classroom topics; and as an aid that can increase classrcom-based learning. (25 references) (DB)

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TELEVISION IN THE CLASSROOM: WHAT DOES THE RESEARCH SAY?

Public Attitudes

There appears to be a perception that the general public and educators are ambivalent, at best, about the use of television in the classroom. For example, a British study by Marie Davies called *Television is good for your kids* starts off with the observation that "there are many people who will think that the title of this book is a heresy. We have all heard, perhaps from newspapers, perhaps from teachers, perhaps from television itself, that television is bad for children" (Davies, 1989).

However, surveys of the Ontario general public and Ontario teachers show a much more positive picture. Adult participants in the Seventh OISE Survey on Attitudes Towards Education indicate solid support for the use of television in education. Seventy-nine percent thought educational television would be somewhat, or very, valuable for learning at school (Livingstone et al., 1988; Sharon 1988). (Eighty-two percent also thought educational television would be valuable for learning at home.) Furthermore, teachers in a 1990 Gallup/TVOntario survey were very favourable about using television in the classroom. Ninety percent of these teachers agreed that television or video programs are helpful, while nearly three quarters thought educational television is essential to good teaching. Nearly two thirds agreed they would be less effective teachers if they didn't use educational TV or video. A very minor proportion of the sample (4 percent) thought it was a waste of time. (Sharon and Gallup Canada, 1990). These survey results therefore show a clear consensus about the use of classroom television, at least in Ontario.

Impacts of Television on Children

In spite of its widespread use, there is a general ambivalence about television's effects. In fact, many social scientists hold that home viewing of television has a negative effect on school achievement. For example, Fetler (1984) reported findings from a survey of over 10,000 California sixth-graders. The study found that students who viewed more than six hours of television per day were found to have lower achievement scores in reading, mathematics, and written expression.

A more recent, comprehensive study by Anderson and Collins (1988) looked at the premise that television viewing has a detrimental effect on the cognitive development of children. They found that this was not the case, and, in fact, that many of the assumptions about television's "hold" on children were incorrect or unsupported:

- While pre-school and early elementary school -age children's comprehension of television can be fragmented, this holds primarily for relatively complex adult-level dramatic presentations. Programs produced for young children consisting of brief segments are readily understood by preschoolers...The assertion that comprehension is poor is only partly verified.
- Contrary to popular assertions, children are cognitively active during television viewing and attempt to form a coherent, connected understanding of programs, which is limited by children's experience with television and the subject matter being portrayed.
- There is no evidence that children generally get overstimulated by television.
- A number of investigations indicate that television may increase attention focusing capabilities. Other scattered research indicates that TV viewing may affect task perseverance and impulsivity, but results are mixed; the effects may depend on the type of programs watched.
- There is no evidence that television makes children cognitively "passive".
- There is some weak evidence that television availability reduces reading achievement, but this occurs during early elementary school years and is probably temporary. Relative to other factors like family encouragement of reading, the effect of television on reading achievement is small if it occurs at all. There is mixed evidence that television viewing increases vocabulary acquisition.

Television Use in the Classroom

Use of educational television in the classrooms is increasing. In 1985 and again in 1989-1990, TVOntario's research departments administered surveys on the use of television in elementary and secondary schools (Wilson, 1986; Sharon and Gallup Canada, 1990). The 1985 study indicated that 39 percent of Ontario teachers used educational television and educational video programs during the fall term; by contrast, the figure rose to 61 percent in 1990. There were no real differences between gender or grades taught; there was a slight tendency for newer teachers to use it more than those who had been teaching for a greater number of years.

Much of the increase can be attributed to increases in the use of VCR technology. Nearly two thirds (61 percent) say their use of educational video-- usually, recorded television programs--

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has increased in the past three years. (Sharon and Gallup Canada, 1990). This increase is concurrent with the widespread availability of VCR's: in 1990, 69 percent of Ontario households had video recorders. Thus, the technology has become familiar to most participants in the educational system.

Videocassette technology has many advantages over broadcast television as a teaching tool. First and foremost is the freedom to present programs at the convenience of the teacher rather than the broadcast schedule; a second advantage is the ability to stop a program at appropriate moments, to reiterate material, or ask and answer questions. Finally, rewinding a part or all of the program can reinforce or summarize a topic or area.

Television-based Learning Systems

A particularly important development in the past decade has been the introduction of television-based learning systems (also called instruction systems). These systems are designed to be used for specific classroom curricula, and are planned with an extensive research component. The instructional unit is the television lesson, but usually there are printed supplementary materials (teacher's guides and student guides being the main ones). Prior to program presentation, the teacher spends a few minutes preparing the class, with questions or review. The class watches the program with the teacher, who will stop and start the program as appropriate to illustrate and reinforce teaching points. After viewing, a variety of techniques are used to continue the lesson: structured discussion, exercises, homework. The programs are viewed on a regular basis and should result in time in some attributable learning gain, attitude, or behavior (Rockman and Burke, 1985).

In Canada, TVOntario is the most frequent producer of such systems, and has produced numerous summative evaluations of their use in the schools. (A summative evaluation looks at the effects of learning systems after they are completed.) These evaluations have limitations common to applied educational research-- lack of adequate control groups in some cases, and the complication of many variables at work over a longitudinal study. Nonetheless, they appear to consistently show a positive contribution to the classroom environment.

Teachman and Prowse (1981) evaluated the *Eureka!* learning system. The learning system includes ten videotapes (each five minutes in duration) and a teacher's guide. It contains elements from Ontario physics curricula across grades 7-11, and was tested with students in that grade range. Use of the learning system significantly increased students' physics knowledge, when students using the system were matched with students who did not. The effect was particularly strong for grades 7 and 8, while the scores of the higher grades increased to a lesser extent.

The Science Alliance learning system was designed for junior level elementary students. The system consists of ten 15-minute science programs, and a teacher's guide. The materials are intended to enrich the instruction of concepts that appear in the junior level science curriculum. Bailey and Parsons (1983) examined the teaching of energy and of machines, with an experimental group using the learning system, and a control group being taught the topics according to their board science curriculum. The experimental group learned more in both topics (although the difference when being taught about energy was not statistically significant).

Habitat was another science learning system developed for junior level students. It is related to the new Ontario curriculum guide, Science is Happening Here, and is intended to instruct students about scientific principles related to animal habitats. The system consists of 20 programs (each 15 minutes long), a teachers' guide, and a magazine for students. According to a summative evaluation (Brown, 1989) students picked up information about animals and their habits during the time they used the learning system. There were four sections in a knowledge test given to students before and after they used the learning system; students did significantly better in three of the four sections.

Duggan and Brown (1986) evaluated the *Telefrancais* learning system, designed to encourage junior-level students to learn and use French as a second language. A majority of students in both core French and immersion classes scored higher on Listening-Comprehension, Listening-Recognition and Listening-Speaking post-tests than on pre-tests, after using the system. Although there were no control groups, the tests were prepared by a French language expert using vocabulary and situations in the television programs, that were less likely to be employed in classroom teaching. This makes it more probable that the increased student scores were a result of learning from the programs.

How are Television-based Systems Best Used in the Classroom?

1. The type of program (animation, live action, documentary, etc.) is not as important as the quality of the program. As American researcher Aimee Dorr says, "it is not simple formulas alone that will lead to more understandable television content for children...what is ultimately needed is careful attention to the details of language, visualization, audiovisual coordination, plot, continuity, sequencing, pace, characters, and characterization. Only a coordinated, thoughtful use of all elements of a production will lead to content that viewers will easily understand as producers intended." (Dorr, 1986)
2. The quality of teaching is essential. Television systems are not a substitute for teaching-- they are supplements and aids. The evaluation of *The Science Alliance* concluded that "instructional materials can only be as effective as the teacher using them." (Bailey, 1983). Regardless of how good a series is, its potency as a learning tool depends upon the teacher.
3. The system cannot simply be "turned on" but has to be prepared-- to be integrated with lessons and teaching style. No one is more aware of this than the teachers themselves. In the TVO/Gallup survey, most (83 percent) who used educational television agreed that more time to preview programs and plan lessons would increase effectiveness. (Sharon and Gallup Canada, 1990)

   Preparation is important because decoding information from television is an extremely complex process (see, Salomon, 1979) and will vary from program to program and from

individual to individual. Television's learning effectiveness is impaired if taken for granted. Robinson and Davis (1990) in their analysis of two sets of studies, found television news to be a much less effective source of learning than news from other media. Among the reasons for this ineffectiveness: there is much more information in television news than people think, and they do not possess the necessary processing skills and background information. Furthermore, "since most viewers regard TV as largely an entertainment medium, they may seriously underestimate the difficulty of decoding television content, including TV news". Salomon and Leigh (1984) found that children's preconceptions of the mental demands required by TV and print are reflected in the amount of effort they report expending when they encounter a specific TV story c its comparable version in print. Less able children appear to work harder than more able ones in comprehending TV and consequently perform quite well. On the other hand, high-ability children look down on TV, knowing in advance that they do not have to invest much mental effort in it. When faced with a somewhat demanding TV story, they learn less from it than their less able peers, and less than their equals who read a comparable text.

4. The material has to fit into the curriculum. Saul Rockman (1980) has claimed that the most important goals for ITV for children should be "that it relate to the school (or pre-school) curriculum and that its programs be designed to match that curriculum. Programs are designed to teach along with, not in place of, the classroom teacher." He gives two examples. *The Electric Company* was not initially designed to be used in the schools, but its content was modified to fit the reading curriculum of American schools. Consequently, it achieved high and continued use. *Freestyle* was designed for both home and school use, but did not adequately take into account the needs of the schools and their curricula; its classroom use, therefore, was not sustained. Chen, Ellis and Hoelscher (1988) looked at a PBS series on mathematics (*Square One Television*) that had been repackaged for classroom use by editing into videocassettes organized by curriculum topics. Teachers felt that reorganizing the topics by curriculum topic helped overcome some of the instructional barriers of the broadcast series.

   The most efficient way to make sure the system is integrated into the classroom is to involve students and teachers from the very beginning. This can be done by creating a working committee of teachers and educators who will work with the producers of the programs. Research is also essential. A student needs assessment will determine the 'fit' of curriculum and program content. Formative evaluation tests the program and related materials with the target audience at the early stages of development, from conceptualization to development of the first pilots and draft materials. As a recent example, Davis (1991) tested the pilot program of a series on literacy (Reading Rap) with teachers and junior level students in the Toronto area. The applicability of the concept and the main characters, pace of the programs, and suitability to the curriculum and student population (students with reading disabilities) were examined. Recommendations were given to the series producer, who incorporated the findings into later programs and the development of print materials.

5. Television is especially useful as a motivator. In the evaluation of TVO's *Mathmakers* learning system, teachers in all junior level grades thought the programs were especially strong in encouraging enthusiasm for math and relating math to the real world. (Gillis and Duggan, 1980). A quarter of the students in the Habitat evaluation said they liked the learning system more than anything else in their science class. They especially appreciated the characters and habits of animals as presented in the programs, and were stimulated by the variety and amount of new information about animals (Brown, 1989).

6. Television learning systems also have potential in introducing emotionally difficult subjects. *The Final Chapter?* educational package was developed to provide secondary school educators with the resource that approached the nuclear issue in a factual, rational way. The package consisted of a 75-minute television program, a transcript including all the factual material, and a teacher's guide, which included exercises for discussion starters and opportunities for research and writing. A summative evaluation concluded that discussions and research assignments that were initiated as a result of the package appeared to relieve the feelings of helplessness and restore a sense of personal control about the nuclear issue for most students (Duggan, 1986).

7. TVOntario research has shown that teachers have problems incorporating television segments that are shorter than 4 minutes, but viewing times longer than 15 minutes can be too demanding for students (Brown, 1989). Viewing times of 4-15 minutes appear easiest to integrate into classroom teaching, and most appealing to students.

Limitations on Utilization

The optimal use of the instructional systems depend upon teachers having access to the system. One limit is availability of material related to the curriculum. In the 1989-90 TVO/Gallup survey, two thirds of users of educational TV said that a larger selection of related programs would substantially increase use (Sharon and Gallup Canada, 1990). Another limitation is in access to print support material. Teacher and student guides, and other resource documents are usually developed along with the programs and intended to be used with them. There is some evidence, however, that print material may not be reaching the classroom. (Sharon, Marom and Sheth, 1990).

Teacher Training

A recent British study has found that among the obstacles to effective use of television in the classroom, one of the most important was a lack of adequate teacher training in the use of television (Duncan, 1991). Teacher training is something of problem in Ontario as well. The Gallup-TVO survey showed that most teachers in elementary and secondary schools were able to get practical information about the availability and operation of video equipment, and what programs are available.

However, under half the sample reported that school and board staff provided assistance in relating media resources to curriculum needs. Furthermore, fewer than four in ten teachers report having attended a teacher training workshop concerning the classroom use of television or video: 39% of elementary teachers, and 36% of secondary teachers, had attended such a workshop. (Sharon and Gallup Canada, 1990).

Although new teachers appear positively disposed towards using television with their students, training of new teachers is often less than comprehensive. A 1985 study by Duggan and Brown suggested that "TV use is not part of teacher training, and is not encouraged in the practicum teaching sessions". They noted, for example, the Faculty of Education calendar for Queen's, where out of 107 full and half courses listed in the university's education calendar, only one (a half course option) had television listed as a field of study. (Duggan and Brown, 1985). Circumstances have changed somewhat: in particular, the Ministry of Education's revised 1987 English curriculum guide has given an increased profile to media education in the province. Still, instructing student teachers about television does not appear to be a high priority. Out of 168 courses offered by faculties of education at the universities of Toronto and York in 1990-1991, two optional courses looked at using television in the classroom (and in these, television was only one of several educational media studied). Other courses may include using instructional television at the discretion of the professor, and student teachers may also receive instruction during their practicum period. But it is quite possible for teachers to be trained without even minimal attention to television use.

Conclusion

Television is widely used in Ontario public schools and is appreciated for making teaching more effective. Yet studies on the effectiveness of television as a learning tool outside of the classroom are ambivalent: many have claimed television to have a negative effect on learning, others show neutral or moderately positive effects. Much of the uncertainty may have to do with the complexity of decoding information from television-- which is a much more challenging process, requiring more background information, than many people seem to think. There is evidence that decoding can be controlled in the classroom. In television-based systems, the teacher has control over the method of presentation and is able to incorporate the programs and print material. These systems are effective as teaching aids, not as a replacement to teaching. Furthermore, they cannot just be "turned on", but require preparation by the teacher, and incorporation into on-going classroom lessons. There must be a close "fit" between the television component, the school curriculum, and the student. Despite widespread use, there are some limitations in accessing the programs and print material, and in teacher training. But when properly employed, television can be effective as a motivator for students; as an introduction to classroom topics; and, as an aid that can increase classroom--based learning.

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